



**CITY OF PHILADELPHIA
DEPARTMENT OF PUBLIC HEALTH
AIR MANAGEMENT SERVICES**

Plan Approval - DRAFT

Approval No: 12195

Source: Philadelphia Energy Solutions
Refining and Marketing LLC (PES)

Plant ID: 01501

Owner: Philadelphia Energy Solutions Refining
and Marketing LLC (PES)
Address: 3144 Passyunk Avenue
Philadelphia, PA 19145

Location: 3144 Passyunk Avenue
Philadelphia, PA 19145

Attention: Mr. Charles Barksdale
Manager, Environmental Department
(215) 339-2074

In accordance with provisions of Title 3 of the Philadelphia Code, the Air Management Code of February 17, 1995, as amended, and after due consideration of an application received under the rules and regulations of Philadelphia Air Pollution Control Board and the Pennsylvania Department of Environmental Protection (PADEP), the City of Philadelphia, Department of Public Health, Air Management Services (AMS) on xxxxxx, 2013, approved plans for the modification and temporary operation of the air contamination device(s) described below:

- Replace the MMBTU per hour firing rate limits with MMBTU per rolling 12-month period limits for the following seven (7) process heaters:
 - Unit 231 B101 Heater (rated capacity 104.5 MMBTU/hr)
 - Unit 865 11H1 Heater (rated capacity 87.3 MMBTU/hr)
 - Unit 865 11H2 Heater (rated capacity 64.2 MMBTU/hr)
 - Unit 210 H101 Heater (rated capacity 192.0 MMBTU/hr)
 - Unit 210 H201A/B Heater (rated capacity 254.0 MMBTU/hr)
 - Unit 866 12H1 Heater (rated capacity 61.2 MMBTU/hr)
 - Unit 868 8H101 Heater (rated capacity 60.0 MMBTU/hr)
- Install Ultra Low-NOx Burners (ULNBs) on the following process heaters:
 - Unit 231 B101 Heater
 - Unit 865 11H1 Heater

This plan approval expires xxxxxx.

This plan approval is subject to conditions prescribed in the attachment.

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Edward Wiener
Chief, Source Registration.

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1. The heaters and crude units listed on the cover shall be operated in accordance with the specifications in the application (as approved herein).
2. Emissions from the heaters shall not exceed the following limits in tons per rolling 12-month period, calculated monthly: [Application]

| | NOx | SO2 | TPM/PM10/PM2.5 | CO | VOC | GHG |
|------------------|------|-----|----------------|------|-----|---------|
| 231 B101 Heater | 12.8 | 0.8 | 3.1 | 34.4 | 2.3 | 49,243 |
| 865 11H1 Heater | 10.5 | 0.7 | 2.6 | 28.5 | 1.9 | 40,777 |
| 865 11H2 Heater | 28.3 | 0.5 | 1.8 | 20.4 | 1.3 | 29,168 |
| 210 H101 Heater | 73.1 | 2.7 | 6.1 | 66.9 | 4.4 | 95,847 |
| 210 H201 Heater | 32.6 | 3.2 | 8.0 | 88.5 | 5.8 | 126,707 |
| 866 12H1 Heater | 25.8 | 0.5 | 1.7 | 18.6 | 1.2 | 26,601 |
| 868 8H101 Heater | 27.1 | 0.6 | 1.7 | 18.9 | 1.2 | 27,054 |

Total Particulate Matter (TPM), PM10, and PM2.5 emissions include both filterable (Method 5/201A) and condensable particulate (Method 202) for this condition.

Greenhouse Gas (GHG) emissions are expressed in terms of Carbon Dioxide Equivalent (CO₂e), based upon a global warming potential of CH₄ = 21 and N₂O = 310.

3. Nitrogen Oxides (NO_x) emissions shall not exceed the following: [Application]
 - a. 0.03 lbs/MMBTU for Unit 231 B101 Heater.
 - b. 0.03 lbs/MMBTU for Unit 865 11H1 Heater.
 - c. 0.113 lbs/MMBTU for Unit 865 11H2 Heater.
 - d. 0.089 lbs/MMBTU for Unit 210 H101 Heater. [Case-by-case RACT Plan Approval dated August 1, 2000]
 - e. 0.03 lbs/MMBTU for Unit 210 H201A/B. [AMS Plan Approval No. 10180, dated 2/3/11]
 - f. 0.113 lbs/MMBTU for Unit 866 12H1 Heater.
 - g. 0.113 lbs/MMBTU for Unit 868 8H101 Heater.
 - h. Compliance determination shall be based on a 365-day rolling average and NO_x Continuous Emission Monitoring System (CEMS) data for Unit 210 H201A/B Heater and any heater that installs and certifies a NO_x CEMS in the future. Compliance determination shall be based on three 60-minute test runs during an AMS-approved stack test for heaters that do not have a certified NO_x CEMS.
4. Particulate Matter (PM) emissions shall not exceed the following:
 - a. 0.20 lbs/MMBTU for Unit 231 B101 Heater. [AMR II, Section V.1 – assures compliance with 25 Pa. Code §123.11]
 - b. 0.10 lbs/MMBTU for Unit 865 11H1 Heater. [AMR II, Section V.2 – assures compliance with 25 Pa. Code §123.11]
 - c. 0.10 lbs/MMBTU for Unit 865 11H2 Heater. [AMR II, Section V.2 – assures compliance

Commented [pw1]: In terms of PA's NSR regulations these emissions are considered the projected emissions for this project. PA's NSR regulations state if the projected actual emissions for a regulated NSR pollutant are in excess of the baseline actual emissions, the following apply, the projected actual emissions for the regulated NSR pollutant must be incorporated into the required plan approval or the operating permit as an emission limit. This includes these limits as well as the projected emissions of all the ancillary units affected by this project. AMS make sure all projected actual emissions are included as limits in this permit. Also provide the applicable PA NSR citation

Commented [pw2]: This is a PSD permit for CO but nowhere in this permit are the applicable state PSD requirements called out or identified. AMS needs to identify these requirements in this permit and provide the applicable citations

Commented [pw3]: Condition #2 appears to be conflict with condition #16.a. This is due to the fact that in condition #2, the test method type in parentheses next to each PM2.5 species is used as the basis to characterize or delineate each of the two species comprising Total PM 2.5 limit in condition #2, thus it would follow that in order to demonstrate compliance, the facility must do a PM2.5 a stack test on each target heater and each test must adhere to Method 5 / 201A and Method (202) to determine the total PM2.5 emission limit compliance to the PM limit under condition #2. This appears be in conflict with condition #16 which allows a choice between AMS approved stack test data if "a stack test is ever required"; or, AP-42, which contains PM 2.5 filterable and condensable emission factors (which the AP42 rates as a D --Below average); or other AMS-approved emission factors. AMS must clarify this apparent conflict.

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with 25 Pa. Code §123.11]

- d. 0.19 lbs/MMBTU for Unit 210 H101 Heater. [25 Pa. Code §123.11 – assures compliance with AMR II, Section V.1]
- e. 0.10 lbs/MMBTU for Unit 210 H201A/B Heater. [AMR II, Section V.2 – assures compliance with 25 Pa. Code §123.11]
- f. 0.10 lbs/MMBTU for Unit 866 12H1 Heater. [AMR II, Section V.2 – assures compliance with 25 Pa. Code §123.11]
- g. 0.10 lbs/MMBTU for Unit 868 8H101 Heater. [AMR II, Section V.2 – assures compliance with 25 Pa. Code §123.11]

PM emissions include only filterable particulate (EPA Method 5) for this condition.

- 5. Carbon Monoxide (CO) emissions from each heater shall not exceed the following on an hourly basis. Application – Ensures compliance with AMR VIII, Section II.6 for each heater and AMS Installation Permit. 03054 dated July 29, 2003 for Unit 868 8H101 Heater]
 - a. 8.6 lbs/hour for Unit 231 B101 Heater.
 - b. 7.2 lbs/hour for Unit 865 11H1 Heater.
 - c. 5.3 lbs/hour for Unit 865 11H2 Heater.
 - d. 15.7 lbs/hour for Unit 210 H101 Heater.
 - e. 20.8 lbs/hour for Unit 210 H201A/B.
 - f. 5.0 lbs/hour for Unit 866 12H1 Heater.
 - g. 4.9 lbs/hour for Unit 868 8H101 Heater.
 - h. Compliance determination shall be based on three 60-minute test runs during an AMS-approved stack test.
- 6. Sulfur Dioxide (SO₂) emissions from each heater shall not exceed 500 ppmvd. [25 Pa. Code §123.21(b)]
- 7. Each heater shall only burn refinery fuel gas.
 - a. Each heater shall not burn any fuel gas that contains hydrogen sulfide (H₂S) in excess of 230 mg/dscm (0.10 gr/dscf) [40 CFR 60.104(a)(1), Consent Decree Order 05-CV-2866]
- 8. Each heater shall be limited to the following rolling 365-day heat input limits: [Application]
 - a. Unit 231 B101 Heater shall not exceed 856,000 MMBTU on a rolling 365-day basis.
 - b. Unit 865 11H1 Heater shall not exceed 699,000 MMBTU on a rolling 365-day basis.
 - c. Unit 865 11H2 Heater shall not exceed 500,000 MMBTU on a rolling 365-day basis.
 - d. Unit 210 H101 Heater shall not exceed 1,643,000 MMBTU on a rolling 365-day basis.
 - e. Unit 210 H201A/B Heater shall not exceed 2,172,000 MMBTU on a rolling 365-day basis.

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- f. Unit 866 12H1 Heater shall not exceed 456,000 MMBTU on a rolling 365-day basis.
 - g. Unit 868 8H101 Heater shall not exceed 480,000 MMBTU on a rolling 365-day basis.
9. The Permittee shall install Ultra Low-NOx Burners (ULNBs) on the Unit 231 B101 Heater and the Unit 865 11H1 Heater. Each heater must comply with its existing lbs/MMBTU capacity limit until it has ULNBs installed and has demonstrated compliance with the 0.03 lbs/MMBTU NOx emission limit through an AMS-approved stack test. The NOx emission limits in Conditions 2 and 3 for these heaters are not applicable until the ULNBs have been installed. [Application]
10. The Permittee shall operate the facility consistent and within the projected future actual emissions basis contained in the plan approval application. [Application]
11. The Permittee shall perform an annual adjustment or tuneup on each heater. This adjustment shall include, at a minimum, the following: [Case-by-case RACT, 25 Pa. Code §§129.91-95, Section 2E; 25 Pa. Code §129.93(b)(2) and (5)]
- a. Inspection, adjustment, cleaning or replacement of fuel-burning equipment, including the burners and moving parts necessary for proper operation as specified by the manufacturer.
 - b. Inspection of the flame pattern or characteristics and adjustments necessary to minimize total emissions of NOx, and to the extent practicable minimize emissions of CO.
 - c. Inspection of the air-to-fuel ratio control system and adjustments necessary to ensure proper calibration and operation as specified by the manufacturer.
 - d. For gas fired units requiring an annual adjustment or tuneup on the combustion process, the Permittee shall make the annual adjustment in accordance with the EPA document "Combustion Efficiency Optimization Manual for Operators of Oil and Gas-fired Boilers," September 1983 (EPA-340/1-83-023) or equivalent procedures approved in writing by the AMS.
12. Each heater shall comply with 40 CFR 63 Subpart DDDDD by no later than January 31, 2016. [40 CFR 63.7495(b)]
13. Within 180 days of the installation of ULNBs for the Unit 231 B101 Heater and the Unit 865 11H1 Heater and within 180 days of the issuance of this plan approval for the other heaters, the Permittee shall conduct the following performance tests:
- a. NOx for each heater besides the Unit 210 H201A/B Heater, to determine compliance with NOx emission limits in Condition 2 of this plan approval and to use for determining compliance with the rolling 12-month NOx emission limit in Condition 3.
 - b. CO for each heater to determine compliance with the CO emission limits in Condition 5 and to use for demonstrating compliance with the rolling 12-month CO emission limit in Condition 3.

Commented [pw4]: As noted in the per the CAC settlement with PES (see application), PES plans to install the burners within 18 months of plan approval issuance. The installation deadline agreed to by PES and CAC should be an applicable requirement

Commented [pw5]: Insert the existing mmBTU Capacity limits here or refer to those specific sections in the Title V Permit

Commented [pw6]: Insert the projected future actual emissions basis which is the firing rate increases noted on the title page of the plan approval. Also include PA's applicable citation for this applicable requirement

Commented [pw7]: Insert "or as amended" here

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- c. The NO_x and CO tests must be conducted simultaneously.
 - d. Testing shall be conducted in accordance with 25 Pa. Code Chapter 139. The Permittee shall submit a test protocol to AMS for approval at least 30 days prior to the first test and shall submit a test report with the results no later than 60 days after completion of the last test. If at any time AMS has cause to believe that air contaminant emissions from the heaters for any pollutant may be in excess of the limitations specified in this plan approval, or established pursuant to, any applicable rule or regulation contained in 25 Pa. Code Article III, the Permittee shall be required to conduct whatever test are deemed necessary by AMS to determine the actual emission rate(s).
14. The Unit 210 Heater 201A/B shall be equipped with continuous monitors and recorders for NO_x and O₂. The continuous monitors and recorders shall meet the requirements of 25 Pa. Code Chapter 139. [Consent Decree Order 05-CV-2866, 25 Pa. Code §123.51]
15. Compliance with the NO_x limits in Condition 3 shall be based on a rolling 365-day average and NO_x CEMS data for heaters with certified NO_x CEMS and AMS-approved stack test data for the other heaters.
16. Compliance with the rolling 12-month limits in Condition 2 shall be monitored and recorded on a monthly basis for each heater and shall be based on heat input and the following:
- a. NO_x CEMS data for heaters with certified NO_x CEMS and the most recent AMS-approved stack test data for the other heaters. An AMS-approved method may be used for the period prior to the completion of the stack tests.
 - b. CO limits shall be based on the most recent AMS-approved stack test data for each heater. An AMS-approved method may be used for the period prior to the completion of the stack tests.
 - c. For the other pollutants, AMS-approved stack test data if a stack test is ever required. Otherwise, AP-42 or other or other AMS-approved emission factors shall be used.
17. Compliance with the NO_x lbs/MMBTU emission limits for the heaters listed in Condition 3 shall be monitored by quarterly stack sampling with a portable NO_x analyzer for any heater without a certified NO_x CEMS. After one year of sampling, the Permittee may petition AMS for semiannual monitoring. AMS may, at any time, require three one-hour stack tests.
18. The Permittee shall utilize an instrument for continuously monitoring and recording the concentration (dry basis) of H₂S in fuel gases before being burned in any of the heaters that meets the requirements of 25 Pa. Code Chapter 139. [40 CFR 60.105(a)(4)]
- a. The span value for this instrument is 425 mg/dscm H₂S.
 - b. Fuel gas combustion devices having a common source of fuel gas may be monitored at only one location, if monitoring at this location accurately represents the concentration of H₂S in the fuel gas being burned.
 - c. The performance evaluations for the H₂S monitor shall use Performance Specification 7. Method 11 shall be used for conducting the relative accuracy evaluations.

Commented [pw8]: See comment 1

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- d. H₂S shall be monitored at the locations listed in their Title V operating permit.
19. The Permittee shall operate a parametric emissions monitoring system (PEMS) on the 868 8H 101 heater (CU-129) for Carbon Monoxide. The chosen parameters and software CEM shall accurately predict the emissions. Accuracy of the system shall be demonstrated during a stack test. The parameters and predicted emissions shall be monitored and recorded continuously to ensure compliance with the Carbon Monoxide emission limitation of 400 ppm_{dv} at 3% oxygen. [AMS Installation Permit. 03054 dated July 29, 2003]
20. The Permittee shall monitor and record the refinery fuel gas heating value and consumption daily, when each heater is in operation.
21. The Permittee shall monitor and record the MMBTU heat input for each heater hourly and on a rolling 365-day basis, calculated daily, to verify compliance with Condition 8.
- a. Fuel gas BTU content shall be continuously monitored and recorded using the continuous heat input monitor at the 862 Unit or tested and recorded daily. The 862 Unit continuous heat input monitor shall meet the requirements of 25 Pa. Code Chapter 139.
22. The Permittee shall monitor and record compliance with the rolling 12-month limits in Condition 2 on a monthly basis.
- a. Compliance with NO_x limits for heaters with a certified NO_x CEMS shall be based on CEM data. Missing or invalid data shall be handled using the missing data substitution procedures of 40 CFR Part 75.
- b. Compliance with NO_x limits for the other heaters and CO limits for all heaters shall be based on the most recent AMS-approved stack test and heat input or other AMS-approved method for periods prior to the AMS-approved stack test.
- c. Compliance with other limits shall be based on AP-42 or other AMS-approved emission factors and heat input.
23. The Permittee shall monitor and record the operating information and emissions for all target heaters and ancillary units daily and on a rolling 12-month basis, calculated monthly, to demonstrate compliance with Condition 10. Calculations shall be based on AMS-approved stack test or CEM data when available. Otherwise, calculations shall use the methods in the plan approval application unless approved by AMS. Records shall be kept in an AMS-approved format that includes the following for each unit:
- a. The projected future actual emissions listed in the application.
- b. The emissions during the previous rolling 12-month period, calculated monthly.
- c. The calculation method.
24. The Permittee shall keep records of all annual adjustments and tuneups required in Condition 11.
25. The Permittee shall submit quarterly reports to AMS for the continuous monitors required in

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Conditions 14, 18, and 21.a in accordance with 25 Pa. Code Chapter 139 and the Pennsylvania Continuous Source Monitoring Manual.

26. The Permittee shall report excess emission from the process heaters defined as follows: [40 CFR 60.105(e)]
- a. All rolling 3-hour periods during which the average concentration of H₂S as measured by the H₂S continuous monitoring system 230 mg/dscm (0.10 gr/dscf).
27. The Permittee shall submit quarterly reports on the compliance with Condition 10 in an AMS-approved format.